ROBO-N100

10Base-T & 100Base-TX
Ethernet Daughter Board

User's Manual

P/N: 8611N1000032 Version: 1.0

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Table of Contents

How to Use This Manual **2**
Chapter 1. Introduction **3**
1-1 Features of Intel 82559 3
1-2 ROBO-N100 Specifications 4
1-3 Check List 4
1-4 Pin-Assignment 5
1-5 Mechanical Drawing 8

Chapter 2. Hardware Installation **9**

Chapter 3. Software Installation **12**

How to Use This Manual

The manual describes how to configure your ROBO-N100 system to meet various operating requirements. It is divided into four chapters, with each chapter addressing a basic concept and operation of Embedded Board Computer.

Chapter 1: Introduction. This chapter presents what you have in the box and gives you an overview of the product specifications and basic system architecture for this Ethernet Daughter Board.

Chapter 2: Hardware Installation. This chapter shows you how to mount ROBO-N100 onto your system board.

Chapter 3: Software Installation. This chapter describes how to properly install software drivers, in terms of different operating systems.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site: http://isc.portwell.com.tw

CHAPTER 1

Introduction

The ROBO-N100 10Base-T/100Base-TX Ethernet Daughter Board is designed to enhance the capability of any existing computer board that has external 68-pin PCI connector. As an auxiliary PCI device, this daughter board is to increase system integration potential, while still keeps a minimum physical system size. The design of this daughter board is completely based on Intel 82559 10Base-T/100Base-TX Fast Ethernet chipset that stays as the frontier of the current networking technology. It is good for various computing platforms.

The 82559 is Intel's second generation fully integrated 10Base-T and 100Base-TX LAN solution. The 82559 consists of both the Media Access Controller (MAC) and physical layer (PHY) interface combined into a single component solution. The 82559 builds on the basic functionality of the 82558. The 82559 can operate in either full duplex or half duplex mode. In full duplex mode the 82559 adheres with the IEEE 802.3x Flow Control specification. Half duplex performance is enhanced by a proprietary collision reduction mechanism.

1-1 Features of Intel 82559

The ROBO-N100 10Base-T/100Base-TX Ethernet Daughter Board adopts Intel 82559 Fast Ethernet Controller. Features of this Ethernet controller includes:

- 32-bit PCI bus master interface
- Low power (3.3V) consumption for LAN/modem combination design to meet CardBus power requirements
- Compliant with Advanced Configuration and Power Interface (ACPI) and PCI Power Management specification
- Full duplex support at both 10 and 100Mbps
- Support for wake-up on interesting packets and link status change
- Deep power down mode support
- Backward compatible software with 82558 and 82557
- Support for Intel's Adaptive Technology

For detailed specification of 82559, please refer to "82559 Fast Ethernet Multifunction PCI/CardBus Controller"* available in the following web-site link.

http://isc.portwell.com.tw/support/Technical Spec & Users Manual/datasheet/Intel/82559/82559 Datasheet.pdf

** Documents are presented with Intel's official authorization*

1-2 ROBO-N100 Specifications

- **Core Logic Chipset**
  Intel 82559 10Base-T / 100Base-TX Fast Ethernet Controller

- **Onboard LAN Status LED Support**
  Supports three LED indications for LAN speed, LAN active, and LAN Link Integrity

- **68-pin external PCI interface**
  One 68-pin external PCI interface for quick installation with retention bar/screws

- **Standard RJ-45 connector**
  Supports one separate LAN cable with standard RJ-45 connector on bracket for easy connection

- **Default Support for various Operating Systems**
  - ◈ Default supports MicroSoft Windows-98/98SE/2000/ME, Solaris 8, QNX V4.25, FreeBSD 4.0, Linux
  - ◈ No driver is required for these Operating Systems

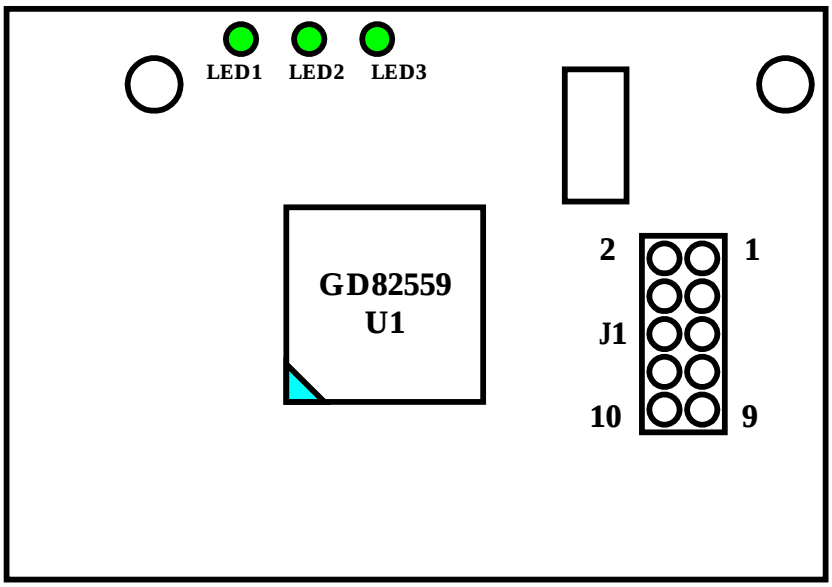
- **Third-Party Support for various Operating Systems**
  - ◈ Software supports MicroSoft Windows-95 OSR2, Windows-NT 3.51/4.0, OS2, SCO OpenServer V5.0.4, SCO Unixware V7.1.1, Novell 5
  - ◈ Drivers are provided for these Operating Systems

- **Physical and Environmental Requirements**
  - ➢ Outline Dimension (L X W): 76.7mm X 50.7mm
  - ➢ PCB layout: 4 layer
  - ➢ Operating Temperature: 0^{o}C ~ 60^{o}C (32^{o}F ~ 140^{o}F)
  - ➢ Storage Temperature: -20^{o}F ~ 80^{o}F
  - ➢ Relative Humidity: 5% ~ 95%, non-condensing

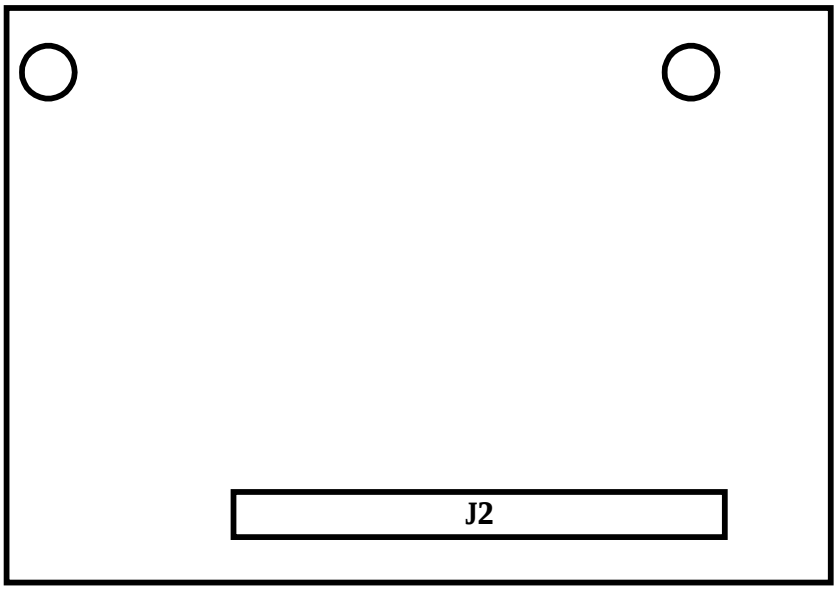
1-3 Check List

- ➢ ROBO-N100 Ethernet Daughter Board
- ➢ LAN Cable with standard RJ-45 connector
- ➢ Retention modules with screws, plastic hoses, and nuts for securing the board firmly

1-4 Pin-Assignment



Component Side



Solder Side

J2 : 68 pin PCI Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	AD0
3	AD1	4	AD2
5	AD3	6	AD4
7	AD5	8	AD6
9	AD7	10	GND
11	VCC	12	AD8
13	AD9	14	AD10
15	AD11	16	AD12
17	AD13	18	AD14
19	AD15	20	GND
21	VCC	22	AD16
23	AD17	24	AD18
25	AD19	26	AD20
27	AD21	28	AD22
29	AD23	30	GND
31	VCC	32	AD24
33	AD25	34	AD26
35	AD27	36	AD28
37	AD29	38	AD30
39	AD31	40	GND
41	VCC	42	BE#0
43	BE#1	44	BE#2
45	BE#3	46	PAR
47	Frame#	48	TRDY#
49	IRDY#	50	GND
51	VCC	52	STOP#
53	Devsel#	54	Reserved for PERR#
55	SERR#	56	REQ#2
57	GNT#2	58	Reserved for REQ#3
59	Reserved for GNT#3	60	GND
61	PCI Clock1	62	PCI Clock2
63	PCIRST#	64	LOCK#
65	IRQ#A	66	IRQ#B
67	IRQ#C	68	IRQ#D

Standard Ethernet RJ-45 Interface Connector

PIN No.	Signal Description
1	TX+
2	TX-
3	RX+
4	Termination to Ground
5	Termination to Ground
6	RX-
7	Termination to Ground
8	Termination to Ground

On-board LED Indicator (for LAN status)

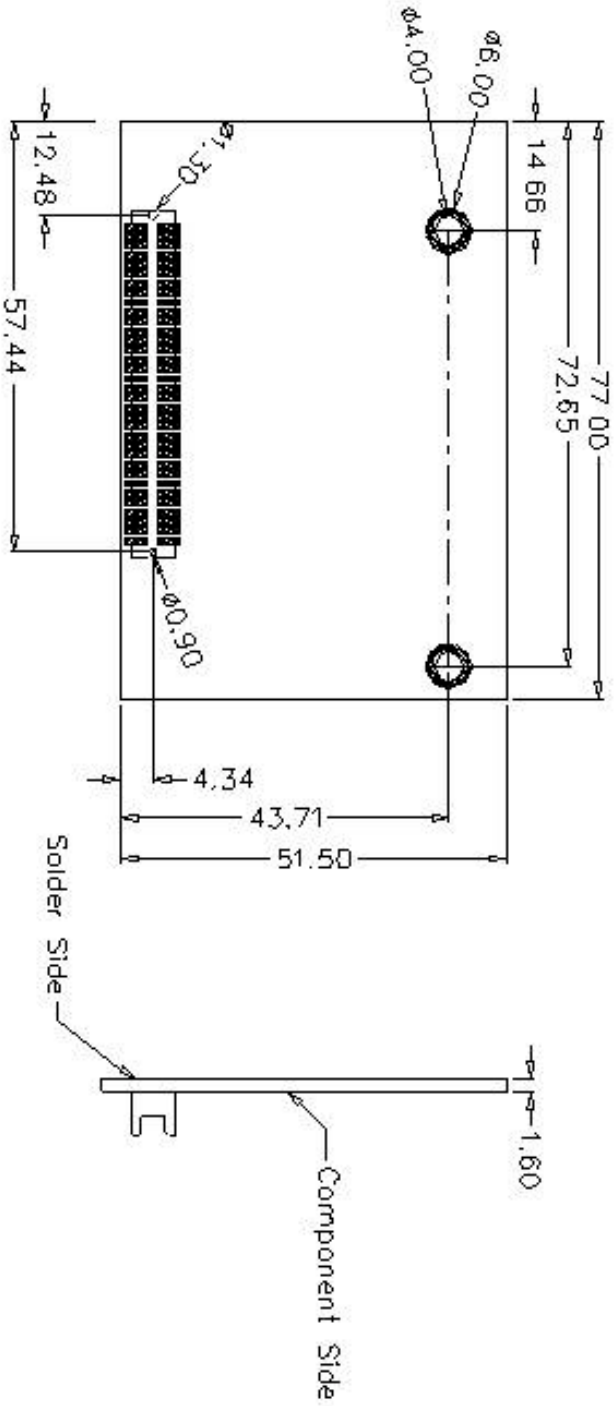
ROBO-N100 provides three LED indicators to report LAN interface status. Below is a guidelineyou're your easy troubleshooting.

LED 1 (left) (LAN link integrity LED)
ON: indicates link is good in either 10 or 100Mbps
OFF: link is bad

LED 2 (center) (LAN active LED)
ON: indicates Tx / Rx activity
OFF: no activity

LED 3 (right) (LAN speed LED)
ON: indicates 100Mbps activity
OFF: indicates 10Mbps activity

1-5 Mechanical Drawing

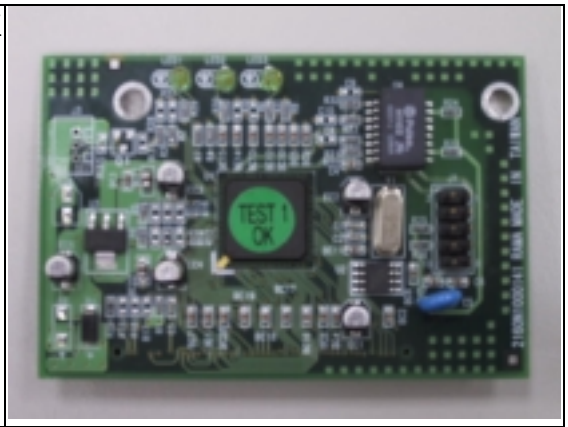
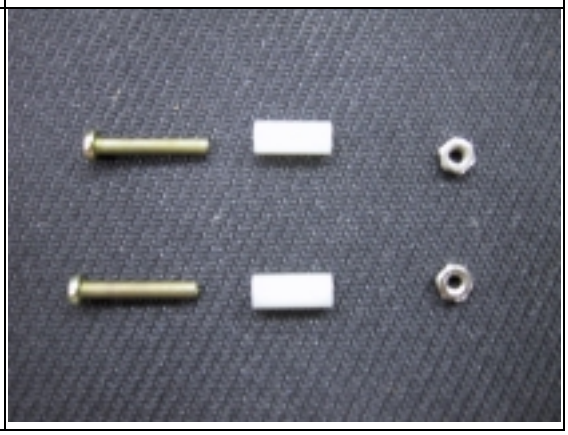


CHAPTER 2

Hardware Installation

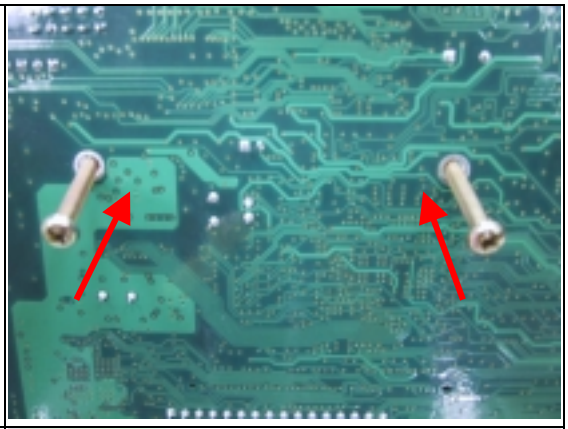
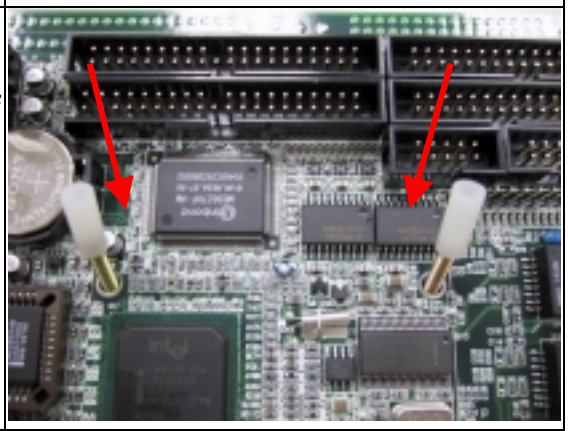
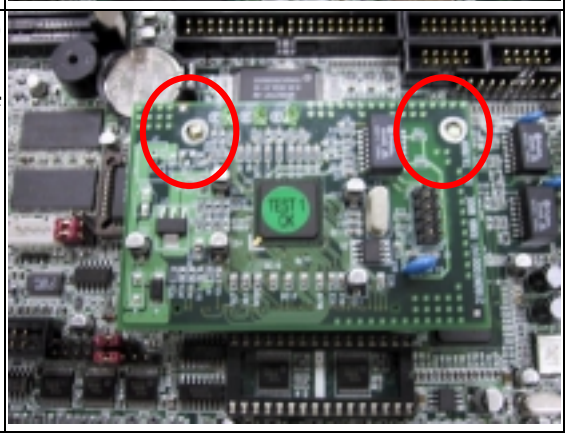
Opening the box

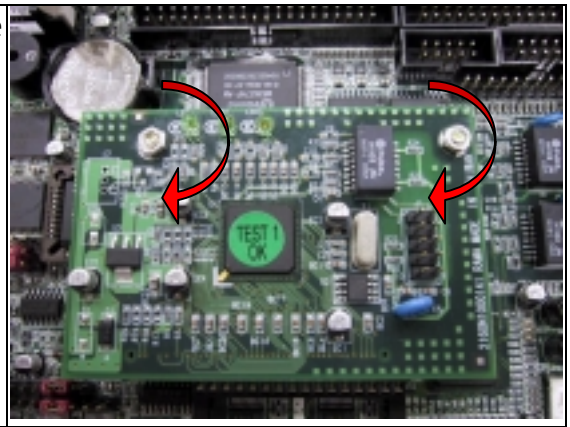
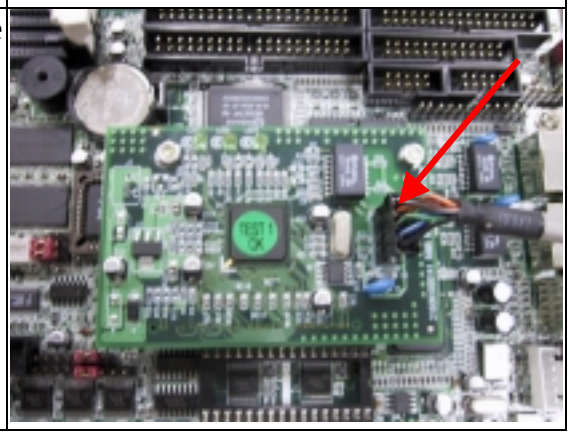
After you open ROBO-N100 package, you should find three hardware items.

I. ROBO-N100 10Base-T/100Base-TX Ethernet Daughter Board. IDSelect: AD21	
II. ROBO-N100 RJ-45 Connector	
III. ROBO-N100 Retention Modules Screw x 2 Plastic hose x 2 Nut x 2	

Installation steps

Please follow the steps below to correct mount ROBO-N100 onto your system board. Portwell ROBO-678 Single Computer Board is used as demonstrated sample here. The same installation step may be applied onto ROBO-668 as well.

I. Apply the two screws (from the retention modules) on the rear side (Soldering Side) of your system board (ROBO-678).	
II. Enhance the two long screws with plastic hoses (from the retention modules) on the component side of your system board (ROBO-678).	
III. Please mount the ROBO-N100 Ethernet Daughter Board onto the onboard 68-pin PCI connector (J2) of your system board (ROBO-678). You need to make sure the two mounting holes of ROBO-N100 are correctly and evenly aligned with the two screws.	

IV. Apply the two screw nuts onto the screws and fascinate them firmly.	
V. Apply the RJ-45 connector cable onto J1 (10-pin).	

CHAPTER 3

Software Installation

Please refer to the installation guide in the enclosed Intel 82559 Ethernet Driver read-me file.

Note:

1. ROBO-N100 does not support Wake-On-Lan. However, this function is available over ROBO-668 (Intel 82559) and ROBO-678 (Intel 82559 and 82801BA MAC).
2. If your operating system does not support multiple Ethernet ports, please remove ROBO-N100 before OS installation. Apply ROBO-N100 onto the board after the completion of OS installation.